



# Cybersecurity

## Cryptography Challenge

[Home](#)[INSTRUCTIONS](#)[RANSOMWARE DECRYPTER](#)[RIDDLE 1](#)[RIDDLE 2](#)[RIDDLE 3](#)[RIDDLE 4](#)[RIDDLE 5](#)[RIDDLE 6](#)

## SCENARIO

You are a Cyber Security Analyst at Nakatomi Hospital. Unfortunately, a doctor opened up an email containing ransomware.

The ransomware spread throughout the hospital and encrypted all patient records. The ransomware has given you two options to decrypt and retrieve your patient records:

1. Pay 100 Bitcoins
2. Solve 6 Riddles

Since you refuse to pay off any ransom, you will need to act fast to solve the six riddles from the ransomware. The doctors need to access the patient records! Lives are at stake!

[Click here to get started!](#)

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# Homepage

## Scenario

You are a Cybersecurity Analyst at Nakatomi Hospital. Unfortunately, a doctor opened up an email containing ransomware.

The ransomware spread throughout the hospital and encrypted all patient records. The ransomware has given you two options to decrypt and retrieve your patient records:

1. Pay 100 Bitcoins
2. Solve 6 Riddles

Since you refuse to pay off any ransom, you will need to act fast to solve the six riddles from the ransomware. The doctors need to access the patient records! Lives are at stake!

## Instructions

The ransomware encrypted the patient records and provided you with six different riddles. These riddles can be found in the above toolbar. To solve each riddle, cryptography concepts will need to be applied.

Once the riddle has been solved, submit your answer on the bottom of each riddle page. If the correct answer is provided, a key will be given.

Keep track of all of your keys. Once they are all obtained, select the RANSOMWARE DECRYPTER link above and enter in all of your keys!

Good luck and act fast. The Nakatomi patients are counting on you!

## Riddle 1


Roses are Red, Violets are Blue,  
Caesar would be 8 is your first clue.

Decrypt **ozcjmz** and enter it below,  
and maybe a key then might just show.

Home INSTRUCTIONS RANSOMWARE DECRYPTER **RIDDLE 1** RIDDLE 2 RIDDLE 3 RIDDLE 4 RIDDLE 5 RIDDLE 6 Q

**Roses are Red Violets are Blue,  
Caesar would be 8 is your first clue.**

**Decrypt **ozcjmz** and enter it below,  
and maybe a key then might just show.**



gruber|

Submit

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### Riddle 1

Congrats, you have solved the first riddle, Your first key is: 6skd8s

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## Riddle 2

Humpty Dumpty Sat on the Wall,  
Humpty Dumpty had a great Fall,

All the king's Horses and all the  
King's Men couldn't decode this  
message for him:

01000111 01100101 01101110  
01101110 01100101 01110010  
01101111

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) **[RIDDLE 2](#)** [RIDDLE 3](#) [RIDDLE 4](#) [RIDDLE 5](#) [RIDDLE 6](#) [🔍](#)

**Humpty Dumpty Sat on the Wall,  
Humpty Dumpty had a great Fall,**

**All the king's Horses and all the  
Kings Men couldn't decode this  
message for him:**

**01000111 01100101 01101110  
01101110 01100101 01110010  
01101111**

Gennerd

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## RIDDLE 2

Congrats for solving the second riddle, the key is: cy8snd2

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## Riddle 3

I'm a little Cipher,  
short and sweet.

Here is my vector,  
and also my key

When I get all steamed up,  
hear me shout!

Just use OpenSSL to figure me out.

### Cipher Text:

4qMOlwEGXzvkmvRE2bNbg==

### Key:

5284A3B154D99487D9D8D8508461A478C7BEB67081A64AD9A15147906E8E8564

### IV (Initialization Vector):

1907C5E255F7FC9A6B47B0E789847AED




## OpenSSL Options:

-pbkdf2  
-nosalt  
-aes-256-cbc  
base64

```
syndria@vm-image-ubuntu-dev:~$ ls
syndria@vm-image-ubuntu-dev:~$ cat hashes.txt
syndria@vm-image-ubuntu-dev:~$ echo "4qMOIvwEGXzvKvMvRE2bNbg==" > encrypted.txt
syndria@vm-image-ubuntu-dev:~$ echo "4qMOIvwEGXzvKvMvRE2bNbg==" > encrypted.txt.enc
syndria@vm-image-ubuntu-dev:~$ openssl enc -pbkdf2 -nosalt -aes-256-cbc -in encrypted.txt.enc -d -base64 -K 5284A3B154D99487D9D8D8508461A478C7BEB67081A64AD9A15147906E8E8564 -iv 1907C5E255F7FC9A6B47B0E789847AED
takagi
syndria@vm-image-ubuntu-dev:~$
```

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) [RIDDLE 2](#) **[RIDDLE 3](#)** [RIDDLE 4](#) [RIDDLE 5](#) [RIDDLE 6](#) [Q](#)

**I'm a little Cipher,  
short and sweet.**

**Here is my vector,  
and also my key** 

**When I get all steamed up,  
hear me shout!**

**Just use OpenSSL to figure me out**

[Submit](#) [Cancel \(Ctrl-C\)](#)

**Cipher Text:**

4qMOIvwEGXzvKvMvRE2bNbg==

**Key:**

5284A3B154D99487D9D8D8508461A478C7BEB67081A64AD9A151  
47906E8E8564

**IV (Initialization Vector):**

1907C5E255F7FC9A6B47B0E789847AED

**OpenSSL Options:**

- ☐ -pbkdf2
- ☐ -nosalt
- ☐ -aes-256-cbc
- ☐ base64

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) [RIDDLE 2](#) **[RIDDLE 3](#)** [RIDDLE 4](#) [RIDDLE 5](#) [RIDDLE 6](#) [Q](#)

**RIDDLE 3**

Congrats on Solving Riddle number 3, here is your key: ud6s98n

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**Cipher Text:**

4qMOIvwEGXzvKvMvRE2bNbg==

**Key:**

5284A3B154D99487D9D8D8508461A478C7BEB67081A64AD9A151  
47906E8E8564

**IV (Initialization Vector):**

1907C5E255F7FC9A6B47B0E789847AED

**OpenSSL Options:**

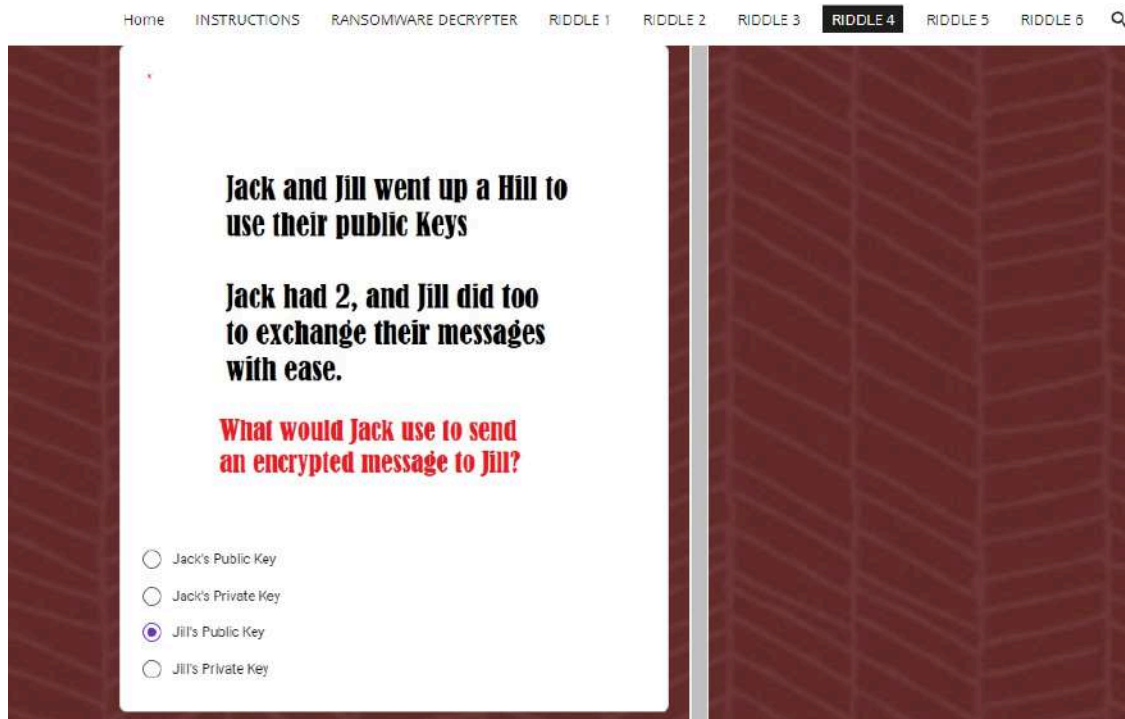
- ☐ -pbkdf2
- ☐ -nosalt
- ☐ -aes-256-cbc
- ☐ base64

## Riddle 4

Jack and Jill went up a Hill to  
use their public Keys.

Jack had 2, and Jill did too  
to exchange their messages  
with ease.

**What would Jack use to send  
an encrypted message to Jill?**



Home INSTRUCTIONS RANSOMWARE DECRYPTER RIDDLE 1 RIDDLE 2 RIDDLE 3 **RIDDLE 4** RIDDLE 5 RIDDLE 6

**Jack and Jill went up a Hill to  
use their public Keys**

**Jack had 2, and Jill did too  
to exchange their messages  
with ease.**

**What would Jack use to send  
an encrypted message to Jill?**

☐ Jack's Public Key

☐ Jack's Private Key

☒ Jill's Public Key

☐ Jill's Private Key

What would Jill use to decrypt Jack's message?

The screenshot shows a Google Form interface with a navigation bar at the top containing links: Home, INSTRUCTIONS, RANSOMWARE DECRYPTER, RIDDLE 1, RIDDLE 2, RIDDLE 3, RIDDLE 4 (highlighted), RIDDLE 5, and RIDDLE 6. The form itself has a purple header labeled 'Part 2'. The question is 'What would Jill use to decrypt Jack's message?'. There are four radio button options: 'Jack's Public Key', 'Jack's Private Key', 'Jill's Public Key', and 'Jill's Private Key' (which is selected). Below the options are 'Back' and 'Next' buttons, and a 'Clear form' link. At the bottom, a Google Forms footer states: 'This content is neither created nor endorsed by Google.'

Part 2

What would Jill use to decrypt Jack's message? \*

- ☐ Jack's Public Key
- ☐ Jack's Private Key
- ☐ Jill's Public Key
- ☒ Jill's Private Key

Back Next Clear form

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Jack and Jill invited Bob, Alice, Tim, and Peter along to exchange some messages. How many keys would they all need for asymmetric vs symmetric encryption?

The screenshot shows a Google Form interface with a navigation bar at the top containing links: Home, INSTRUCTIONS, RANSOMWARE DECRYPTER, RIDDLE 1, RIDDLE 2, RIDDLE 3, RIDDLE 4 (highlighted), RIDDLE 5, and RIDDLE 6. The form has a purple header labeled 'Part 3'. The question is 'Jack and Jill invited Bob, Alice, Tim and Peter along to exchange some messages. How many keys would they all need for asymmetric vs symmetric encryption?'. There are five radio button options: '6 Asymmetric and 15 Symmetric', '10 Asymmetric and 15 Symmetric', '12 Asymmetric and 30 Symmetric', '15 Asymmetric and 12 Symmetric', and '12 Asymmetric and 15 Symmetric' (which is selected). Below the options are 'Back' and 'Next' buttons, and a 'Clear form' link. At the bottom, a Google Forms footer states: 'This content is neither created nor endorsed by Google.'

Part 3

Jack and Jill invited Bob, Alice, Tim and Peter along to exchange some messages. How many keys would they all need for asymmetric vs symmetric encryption? \*

- ☐ 6 Asymmetric and 15 Symmetric
- ☐ 10 Asymmetric and 15 Symmetric
- ☐ 12 Asymmetric and 30 Symmetric
- ☐ 15 Asymmetric and 12 Symmetric
- ☒ 12 Asymmetric and 15 Symmetric

Back Next Clear form

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Tim sent an encrypted message to one of his friends. Which of the following keys did he likely use to encrypt the message?

Home INSTRUCTIONS RANSOMWARE DECRYPTER RIDDLE 1 RIDDLE 2 RIDDLE 3 **RIDDLE 4** RIDDLE 5 RIDDLE 6 🔍

### Part 4

Tim just sent an encrypted message to one of his friends, which of the following keys did he likely use to encrypt the message

- ☐ Tim's Public Key
- ☒ Alice's Public Key
- ☐ Bob's Private Key
- ☐ Tim's Private Key
- ☐ Peter's Private Key

[Back](#) [Next](#) [Clear Form](#)

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Home INSTRUCTIONS RANSOMWARE DECRYPTER RIDDLE 1 RIDDLE 2 RIDDLE 3 **RIDDLE 4** RIDDLE 5 RIDDLE 6 🔍

## RIDDLE 4

Congrats! The Key is: 7gsn3nd2

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## Riddle 5

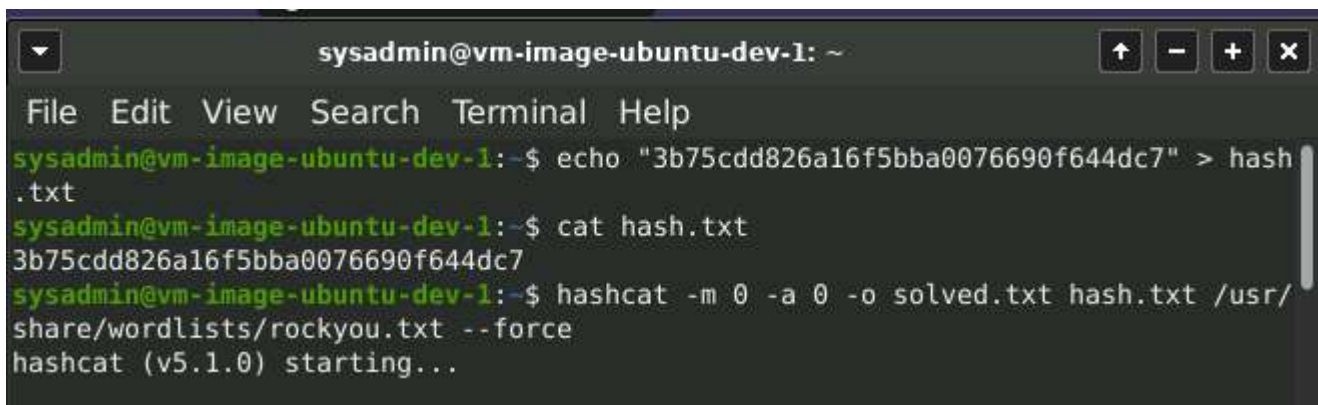
Hey diddle diddle,  
the cat and the fiddle,  
The cow jumped over the moon.

The little dog laughed  
when it found this MD5 hash,

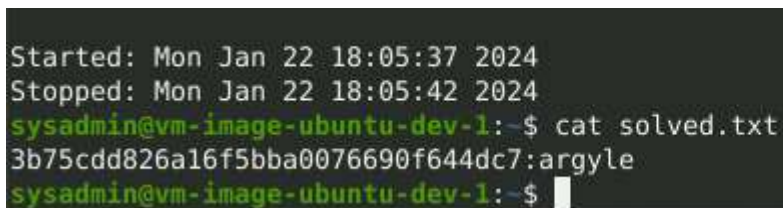
And the dish ran away with the spoon!

**Hash:**

3b75cdd826a16f5bba0076690f644dc7



```
sysadmin@vm-image-ubuntu-dev-1: ~  
File Edit View Search Terminal Help  
sysadmin@vm-image-ubuntu-dev-1:~$ echo "3b75cdd826a16f5bba0076690f644dc7" > hash  
.txt  
sysadmin@vm-image-ubuntu-dev-1:~$ cat hash.txt  
3b75cdd826a16f5bba0076690f644dc7  
sysadmin@vm-image-ubuntu-dev-1:~$ hashcat -m 0 -a 0 -o solved.txt hash.txt /usr/  
share/wordlists/rockyou.txt --force  
hashcat (v5.1.0) starting...
```



```
Started: Mon Jan 22 18:05:37 2024  
Stopped: Mon Jan 22 18:05:42 2024  
sysadmin@vm-image-ubuntu-dev-1:~$ cat solved.txt  
3b75cdd826a16f5bba0076690f644dc7:argyle  
sysadmin@vm-image-ubuntu-dev-1:~$
```

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) [RIDDLE 2](#) [RIDDLE 3](#) [RIDDLE 4](#) **[RIDDLE 5](#)** [RIDDLE 6](#)

Invalidates required question

Untitled Question \*

**Hey diddle diddle,  
the cat and the fiddle,  
The cow jumped over the moon.**

**The little dog laughed  
when it found this MD5 hash,**

**And the dish ran away with the  
spoon!**

argyle

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Check Answer

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) **[RIDDLE 2](#)** [RIDDLE 3](#) [RIDDLE 4](#) [RIDDLE 5](#) [RIDDLE 6](#)

# RIDDLE 5

## RIDDLE 5

Congrats on solving Riddle number 5, Here is your key: `ajy39d2`

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Hash:  
`3b75cdd826a16f5bba0076690f644dc7`

## Riddle 6

Mary had a secret code,  
Hidden in a photo,  
And everywhere that photo went,  
The code was sure to go.

She wrote the passphrase on the  
book, to access the code  
You just need to use some stego  
tricks and the secret will show.

```
sysadmin@vm-image-ubuntu-dev-1:~/Downloads$ steghide extract -sf mary-lamb.jpg
Enter passphrase:
wrote extracted data to "code_is_inside_this_file.txt".
sysadmin@vm-image-ubuntu-dev-1:~/Downloads$ cat code_is_inside_this_file.txt
mcclane
sysadmin@vm-image-ubuntu-dev-1:~/Downloads$
```

[Home](#) [INSTRUCTIONS](#) [RANSOMWARE DECRYPTER](#) [RIDDLE 1](#) [RIDDLE 2](#) [RIDDLE 3](#) [RIDDLE 4](#) [RIDDLE 5](#) **[RIDDLE 6](#)** [Q](#)

### RIDDLE 6

yansilbertz@gmail.com [Switch account](#)

Not shared [Craft saved](#)

\* Indicates required question


Untitled Question \*

**Mary had a secret code,  
Hidden in a photo,  
And everywhere that photo went,  
The code was sure to go**

**She wrote the passphrase on the  
book, to access the code  
You just need to use some stego  
tricks and the secret will be showed.**

mcclane

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# RANSOMWARE DECRYPTER

## RANSOMWARE DECRYPTER

Congratulations! You have decrypted the Ransomware! All the Nakatomi Hospital Records are now Decrypted!

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